

HOW THE BLIND SEE
BY
GABRIEL FARRELL

BF295
F247

NEWARK, N. J.
LOS ANGELES 25, CALIF.
TORONTO 4, CANADA
Euo-Dant INDUSTRIES



AMERICAN FOUNDATION FOR THE BLIND INC.
GIFT OF

How the Blind See

What Is This "Sixth Sense"?

by **GABRIEL FARRELL**



MANY PEOPLE profess astonishment at the way persons without sight get about public highways; they marvel at the unusual ability that enables the blind to sense the presence of objects and avoid passing dangers. Often, at concerts or demonstrations of work by the pupils of the institution for the blind of which I am director, visitors are skeptical about their degree of visual handicap. Their attitude is — "They just can't be blind!" Such skepticism raises the question: Can the blind see? And to this question we who are interested in those with impaired vision give an unequivocal answer: Yes. The blind can see — but not with their eyes.

And if not with their eyes, then how? That question is not so easy to answer. For years it has perplexed students and scientists, seeing people and those without sight. A blind man once said to me, "I don't know how I know that I am approaching a tree but I know that I am. Without fail I know that a tree is before

me as I walk toward it. With the sense of obstacles that I possess, I can avoid crashing into the tree, and that, after all, is the most important fact for a blind person. With my fingers I can discover the size, shape, and texture of the trunk. From the bark I can tell the kind of tree and then I can visualize the branches and the leaves. If it is springtime and the right kind of a tree, I can share in the fragrance of the blossoms. In short, I can see that tree — all except the color."

But is color the supreme element of vision, or the primary part of beauty? Shape and form and texture are all factors of equal value, and these the blind person can "see." Certainly enough sense perceptions may be recorded to make a picture without color. Another factor enters here, for, if the individual has previously seen with his eyes, visual memory enables him to build up pictures, color and all, just as seeing people may visualize scenes which they have never viewed but of which they have read descriptions. Sight, according to a blind man, is long-distance touch with the sensation of color added.

Many are ready to grant that the blind can "see" in so far as an appreciation of beauty is concerned, but a more practical aspect is what causes people with sight to wonder. They want to know how a person totally without sight can walk down a city street — how obstacles are avoided and how a blind person finds his way about. The fact that people with impaired vision do get about with an astonishing readiness is generally granted. But how remains a mystery.

II

MANY REFER to this unique ability of blind people to avoid obstacles and get about as a "sixth sense," as though it could be as

easily localized as sight or hearing. As a matter of fact, three distinct elements enter into this power. In addition to the sense of obstacles, which is the most obvious and is most frequently meant by the term "sixth sense," there is the factor known as the substitution of the senses, or compensation, and also the faculty of orientation built upon muscular memory. All three enter into the abilities credited to the "sixth sense."

Muscular memory is the easiest to accept, for nearly everyone has acquired the ability to walk about in his own home in the darkness of the night and to circumnavigate pieces of furniture when they are in familiar places. We readily memorize the number of steps in a flight of stairs and where the turns are. In like manner the blind learn to walk about familiar places, because muscular memory registers distances between obstacles for which digressions must be made. Living at Perkins Institution, we see many evidences of this, and it is often difficult to believe that our pupils are without sight when they unhesitatingly run about and unerringly make their way from one classroom to another.

Outside my office is a walk leading to the girls' cottages. A little beyond the window the walk turns to go along the end of the building. Many times in the fall I see a girl walk along, hesitate, go back a bit, and then begin to clap her hands. Soon she stops clapping and steps briskly around the corner. She has not yet learned how long that walk is and is getting her bearings by listening for the reverberation from the brick wall of the building. When the vibrations of clapping cease to return, she knows that she is beyond the building and that the turn can be made. This happens only at the beginning of the school year when there are new girls. The older pupils have learned their way, and soon the new ones establish landmarks and develop muscular memory.

III

THE SECOND factor, the substitution of senses, or the compensation that comes through substitution, is more difficult to understand, perhaps because it is based on a deeply rooted fallacy. For years people have believed that because a person is blind the other senses of touch, smell, hearing, and taste become automatically more acute. This is far from the

truth, but it is the source of the many legends that cause people to marvel about those without sight.

That the surviving senses of the blind are not more acute than those of people who can see has been proved in many experiments. Pierre Valley, the late blind professor of literature of Caen University in France, whose psychological study of the blind is an accepted authority, has made such tests and reported:

We certainly knew that it was not enough to become blind for the acuteness of the other senses suddenly to be doubled. We knew that there was no miracle hidden under the substitution of senses, that it was not a kind of providential and miraculous compensation by which nature repaid her victims. We considered it certain that it was due entirely to the intense exercise to which the remaining senses are submitted.

The cost in time and mental energy that the blind pay for the ability to compensate for the loss of sight few seeing people can ever realize. Here at Perkins our first aim is to assist in this difficult task. Following adjustment that leads to acceptance of blindness, we begin to develop sensory acuity. In every possible way we train our pupils to make up for the lost sense, but the attainment of compensation depends upon the will and determination of the pupil. It is easy, therefore, to understand why the blind resent the common belief that the substitution of senses is a free gift of God. It is a hard-earned accomplishment acquired at a cost of untold energy and endeavor.

The first step in the acquiring of compensation is the development of finger dexterity and acuity. For the finger becomes the eye of the blind. With it a person with impaired vision reads, and through it he "sees," by feeling, all objects that come within his reach. Early in our school program we have to make that member of the body keen enough to sense the complexity of the dots of the Braille system, which is the keystone of the education of the blind. This is not always easy. In the first place it violates one of the fundamental laws of education. It calls for the early exercise of the small muscles and not the large, as should be the case. Sometimes we fail. One little boy here last year had a disease which destroyed the ends of his fingers. Another little girl could not seem to acquire acuity in her fingers. A resourceful teacher, however, discovered that her tongue was sensitive to the dots of Braille, and

HOW THE BLIND SEE

the mystery of words was opened to that child through her tongue. Of course individual books and lesson papers were provided especially for her.

In addition to acquiring an acute sense of touch the blind pupil must also build up a wide and varied association of physical and mental elements with tactile impressions. The raised dots on the paper must convey to the finger the impression that seeing people receive when looking at the printed word. In the same way the multiple impressions received through the other senses must be associated with ideas or objects. And all these impressions and associations must be organized and made available for recall as the mind functions.

In addition to feeling, the other senses are also stimulated, somewhat by training but mostly by experience. Latent powers that a seeing person never realizes are called into daily use by the handicapped.

Taking into consideration all these factors, our plea to the seeing world is to set aside the old fallacy of compensation and to judge the blind not by what they have lost but by what they have acquired. Rule out the pity and admiration and accept a blind man as you would any other man.

IV

WE COME now to the idea of the sense of obstacles as the third factor in the "sixth sense." It was given first place at the beginning of our analysis because it is the factor which causes most people to marvel. Again, we must say that it is difficult to explain this sense, so apparent and yet so elusive. I once heard a boy say, "—— is the smartest fellow I know. He can sense a telegraph pole at fifteen feet." The young man referred to is smart in other ways too, for he wears a Phi Beta Kappa key and stands first in scholarship in the present senior class of a school of law. But how does this young man sense a telegraph pole at fifteen feet? I asked him that question, and here is his reply:

The only way that I can describe the feeling that I experience when approaching an obstacle is to say that it is like stepping into a shadow projected from the object. Although I have no light perception whatever, I feel a definite sense of darkness which warns me of the obstacle in my path. I have this feeling not only for objects directly ahead but also of those by the side of the road. Sometimes when walking down Beechwood Avenue [a street near

Perkins] in the middle of the road, I am so aware of the trees on either side that I almost think that I can see them. This is especially so at night, for I sense objects more keenly in the dark than in the daytime.

Asked why he thought that that was so he said, "I think it is primarily due to the fact that there is less noise at night. Noise confuses me more than anything else." Yet this young man, who lost his sight completely at the age of ten, goes to Boston daily by trolley and walks about with an assurance that makes it difficult for strangers to know that he has no sight. The sense of obstacles developed early in this law student, for it is still related that as a boy in the Lower School he could sense a tree with such accuracy that he could hit it with a snowball.

In order to supplement this individual experience and to get firsthand information from others, I asked two groups here at the school to discuss the sense of obstacles with me.

The first group consisted of two retired women teachers and one of our older men teachers. All three possess a keen sense of obstacles, even though each lost his sight at a different age. Both women are aware of objects, and one, who lost her sight at the age of ten, can visualize a tree as she approaches it; the other, who has been blind since birth, has no idea of what a tree looks like. The latter maintained that alertness is the primary factor in employing the sense of obstacles. One must always be attentive, she claimed, to become aware of objects. Whereupon the first woman said: "That is the reason I carry a cane. I can't stand being keyed up all the time, so I let my cane find the objects while I listen to the birds sing." The man in the group confirmed what the women had said and emphasized the fact that noise disrupts the acuteness of the sense and causes confusion. Snow, he claimed, even more than noise, thwarts the sense of obstacles. It is often called "blind man's fog." But to see this man walk to his home outside the grounds on days when there is snow and ice makes it difficult not to marvel at his ability.

The second group consisted of young men now at Perkins pursuing college courses or doing graduate work. There were twelve in this group. Two, however, had useful vision and do not need to depend upon the sense of obstacles. Of the remaining ten, three had light perception, while the others were totally blind. One

was born blind, while the others lost their sight at different ages up to seventeen years. The average of this age was eight. This group included our keenest boys, all of them aware of objects to a high degree. All go about independently; only one carries a cane and then only if he is going alone to a strange part of the city.

V

HOW THEY are aware of obstacles was a question that led to a very ardent discussion. All agreed that hearing and facial perception are the important factors, but seven maintained that hearing is primary, while the other three stood out for facial perception. The former group, however, admitted the feeling of the pressure of air on the face, and all placed the sensation from temple to temple over the eyes. To some the sensation is like a shadow passing over the face. One young man maintained that the feeling is similar to that which one receives upon wetting a finger and holding it up to determine the direction of the wind. All are aware of obstacles at the side while passing them as well as objects directly ahead. All claim that they can sense objects better at night than during the day, probably because it is more quiet. The young men agreed with the older people that noise hinders the ability to sense objects.

In the discussion we took up the question of how keen this sense could be. They all agreed that a lamppost or tree should be sensed at ten feet and a parked car at twenty. The common opinion that the object must be at the level of the head was not sustained. In a city street the air seems more dense and flows along with the street. Some are able to sense curbstones, but, curiously, those having this acuity are aware of the distant curb first. They cannot sense the drop of the first curb but do pick up the rise of that across the street. Aware of this, they watch for the near curb. They feel this is fortunate because it is better to know of the curb ahead, while crossing the street, than to place definitely the near curb, while in the comparative security of the sidewalk.

A point on which all agreed is that to utilize this sense one has to be alert and attentive to every sensation. One boy said it was necessary to be "conscious" every minute. This led to a discussion of whether or not the sense of ob-

stacles could be trained and developed, as we try to strengthen the other senses for compensation. There were many ideas on this subject. One young man would build mazes and turn the newly blind loose in them. Others said that the large square posts that we have at the entrance of the closes and the cottages are helpful but doubted whether the training is worth the bumps received. Another believed in the old story of teaching swimming by throwing the pupil off the dock. He would take those inclined to sit around, put them in the beach wagon, drop them off downtown, and tell them to find their way home.

Cruel as these suggestions may sound, there is a fundamental truth in them. All the boys maintained that the sense of obstacles is but the by-product of a determination to be independent and not let the loss of sight wreck one's life. If a blinded person sits at home he will never acquire a sense of obstacles or develop what is popularly called the "sixth sense." This depends entirely upon each person's persistence. As one young man expressed it, "a sense of obstacles develops in inverse ratio to the amount of help that one is willing to accept." These young men feel that practically all blind persons can acquire this ability if they make up their minds to do so. The sense is, however, acquired gradually and in varying degrees, and each person soon learns when he has reached his maximum power.

There is one aspect of this development which is poignantly disheartening. When the power to be aware of obstacles begins to manifest itself with clearness, nearly everyone experiences a flash of hope that sight is coming back. Soon, however, the truth dawns, and the blinded person lives through another disappointment. Another adjustment is sometimes necessary, and, when it is made, the power is accepted and used.

The extent to which these young men use their sense of obstacles is interesting. All go about to their college studies in Boston and Cambridge without guides. The young man born blind can throw a baseball to his brother, who indicates his location by thumping a fist in the catching mitt. The one who was last to lose his sight plays golf. Like a true golfer he claims only to play "at" it, but he does nine holes in about eighty, which he says gives him a lot of exercise. His chief difficulty, he com-

HOW THE BLIND SEE

plains, is that he cannot follow the golfer's first rule: Keep your eye on the ball.

VI

IT WOULD seem from these observations that there are certain points definitely established in the realm of the "sixth sense." It is generally conceded that muscular memory is easily acquired and constitutes an important factor in the development of the extra sense; that compensation through the substitution of other senses does exist, although there is a prevailing fallacy regarding the way compensation is gained; and that a sense of objects as such may be acquired in proportion to the desire of the blinded person for independence and the alertness leading to receptivity. We know also that snow disrupts the working of this sense and that noise makes it very difficult.

Whether or not all blind persons can be trained in this sense is doubtful, although, as in all forms of human knowledge, there is probably more that we can learn about this special ability. Scientists are anxious to carry on more experiments under definite control, but, as one of our boys stated, "There is little practical promise in such experiments because we do not live in a controlled world."

VII

SCIENTISTS, especially the psychologists, have not been unmindful of the problem created by this unique power possessed by the blind and have offered many explanations. Diderot seems to have been first to call the attention of the scientific world to the superior sensory capacities of the blind. In 1749 he wrote:

The blind man of Puisaux judges his nearness to the fire by the degree of heat; of the fullness of vessels by the sound made by liquids which he pours into them; of the proximity of bodies by the *action of air on his face*. He is so sensitive to the least atmospheric change that he can distinguish between a street and a closed alley.

One of the most striking accounts showing facial vision in a very high degree is contributed by W. Hanks Levy in his *Blindness and the Blind*, published in 1872:

Whether within a house or in the open air, whether walking or standing still, I can tell, although quite blind, when I am opposite an object, and can perceive whether it be tall or short.

Until 1890 all observations of this power of

the blind were casual and unchecked by scientific controls. In 1895 the first scientific studies of this power were begun in Germany by Dr. Theodore Heller, who claimed that a blind person approaching an object is first aware of the changes in the sound of his footsteps and then gives careful attention for sensations of pressure in his forehead. If these sensations arise, he knows that there is an obstacle in his path and turns aside.

At about the same time three psychologists in America became interested in the obstacle sense. In 1890, William James raised the question whether "one might not be conscious of the presence of objects by means of tactile sensations from the tympanic membrane of the ear." Dresslar tested this suggestion by a series of experiments in 1893, and his tests were repeated in 1904 by Robert MacDougall, who questioned the importance of audition as the essential factor for all observers; for, with his subjects, plugging the ears made practically no difference in the correctness of response, while preventing facial sensibility considerably reduced the ability. He said in conclusion:

It thus appears that the process in question is not restricted to any one type of sensory stimulation, but may depend in different individuals, upon any one of several such sources, and in ordinary cases probably involves a combination of these.

The most recent treatise and perhaps the most exhaustive study of this problem is a publication entitled *Facial Vision or the Sense of Obstacles*, by Samuel P. Hayes. Dr. Hayes, who is professor of psychology at Mount Holyoke College and director of psychological research at Perkins Institution and the Pennsylvania Institution for the Instruction of the Blind, has been engaged in this study for eighteen years. In his paper he summarizes the present situation:

It is possible to distinguish several distinct trends in the study of the obstacle sense. There is a persistent inclination to regard this ability as a true sense achievement, the heightened response of some yet undiscovered sense organ under the guidance of selective attention. Popular psychology locates this "sixth sense" in the forehead and its experimental advocates offer evidence for facial vision.

It is still on the level of sensation if the ear is preferred to the skin, but with the emphasis on the interpretation of sensory cues, either from one sense realm or through a combination of several we discover the second tendency, the explanation of facial vision as a perceptive process in which the cues may be so slight that it is difficult to distinguish them. . . .

A third trend is Dolanski's suggestion that we are not dealing with a simple sensory response to external stimulation, but with a much more complicated process. Sensory cues which may be so slight that they are subliminal (hence difficult to catch and study introspectively) arouse fear which expresses itself in an instinctive way, causing the involuntary contraction of tiny muscles under the skin. The sense of obstacles, then, is the interpretation of sensations in the skin which are aroused when we sense external cues that suggest danger and so arouse fear.

The phenomena of this third trend, commonly called the goose-flesh theory, have not come within the experience of any of our people here at Perkins.

VIII

BEYOND the scientific studies there will always be the human factor. Despite all the explanations of the psychologists, people will continue to wonder at the stories of the mysterious power of handicapped people. I shall never cease to marvel at our seven-year-old deaf-blind boy who can unerringly tell whether it is a man or a woman who enters the room; or at our seventeen-year-old doubly handicapped boy who calls his teacher by name whenever she approaches; or at one of the small girls in the same group, who places her blocks (all the same shape) in piles according to color. One of our former deaf-blind pupils has learned to keep house most successfully and carries on her work in the kitchen in an orderly way, but if she comes down to that room when it is very cold she loses all sense of direction and cannot do her work or get about. Perhaps an explanation of such incidents may some day be found which will be logical. Logical in the fashion of our deaf-blind seven-year-old, who, on first encountering a dog, placed his hand on the animal's mouth in the approved fashion for receiving speech and said to it, "Talk, talk!" Why shouldn't he expect a dog to talk when day after day he is drilled in speech development?

Memory is another function in which our pupils seem to show superior skill. They can memorize in an astonishing way, and some with low mental ability seem to surpass the brighter pupils. This superiority recently put us in an embarrassing situation. We had given a boy a mental test and found him of such low rating that we discharged him as uneducable. At the State training school to which he was sent he was again tested, but this time he gave a magnificent account of himself — for

he had remembered all the tests! Another interesting field of inquiry is the extent to which those who have lost their sight late in life can build visual images from memory. We have a boy who claims that he can sit at the piano in the living room of his home and visualize the contents of that room and his family sitting in it as clearly as when he saw it as a child. When he can lose himself in his music this boy can "see" that room and the people in it.

IX

OVER AND ABOVE all anecdotes and incidents is the fact that many handicapped people reveal a unique and interesting power. How may this power be trained and developed? Can it be imparted to others? From our experience it would seem that the most hopeful avenue is to make those who have lost their sight *want* to "see." This is not accomplished by stimulating the senses — the recognized five and the possible sixth — but by inspiring a determination to be above physical sight. The assurance that those without sight can achieve and that there are fields of endeavor in which the blind can give leadership must be created.

In achieving values of spiritual worth and seeing that which eyes cannot behold, there will be for the blind moments of mental darkness which transcend physical darkness. In such times I wish our people could hear Sir Arthur Eddington:

When from the human heart the cry goes up, "What is it all about?" it is no true answer to look only at that part of experience which comes through certain sensory organs . . . but rather it is about a spirit in which truth has its shrine, with potentialities of self-fulfillment in its response to beauty and right.

It is this response to truth, beauty, and right that we want our youth to have; and to obtain it the condition of the sensory organs is relatively unimportant.

The will to achieve, however, is all-important, and perhaps we are making our best contribution to the attainment of a "sixth sense" if we can call into power the spirit which enabled John Milton, when his eyes "took holiday," to write:

*And wisdom at one entrance quite shut out.
So much the rather thou Celestial light
Shine inward, and the mind through all her powers
Irradiate, there plant eyes, all mist from thence
Purge and disperse, that I may see and tell
Of things invisible to mortal sight.*

BF295

c.3

F 247

Farrell, Gabriel
How the blind see.

Date Due

BF295

c.3

F 247

Farrell, Gabriel

AUTHOR

How the blind see.

TITLE

DATE
LOANED

BORROWER'S NAME

